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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,722	05/07/2001	Klaus Peter Crone	AG-6564	3395

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CONNOLLY BOVE LODGE & HUTZ, LLP
1220 N MARKET STREET
P O BOX 2207
WILMINGTON, DE 19899

EXAMINER
MULPURI, SAVITRI

ART UNIT	PAPER NUMBER
2812	15

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/744,722	Crone et al
Examiner	**Art Unit**
Savitri Mulpuri	2812

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Dec 13, 2002* .

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-9* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/13/02 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-6, 8,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaguchi Tadatake (jp-05090624) in combination with Militsky et al.

Taniguchi teaches depositing CdTe on PET wherein transition temperature is less than 200 C. Tanicguchi does not discloses annealing the CdTe. Mitlitsky discloses a method of annealing

CdTe.. Taniguchi et al teaches coating of CdTe from the mixture solvent CdTe powder . Choosing CdTe particle diameter average with the range of 3-5 nm would have been well with in the one of ordinary skill in the art dependingon the conversion efficiency of the solar cell. It would have been obvious to one of ordinary skill in the art to anneal CdTe in the invention of Taniguchi et al because annealing increasing the photoelectric conversion efficiency of the solar cell.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Militsky in combination with Takenouchi et al. .

Mitlitsky et al discloses a product of forming solar cell device by the following process steps: Providing low temperature plastic material such as polyethersulfone (PES), and such plastic material is incapable of sustaining process temperature of higher than 180 C and such materials are called low temperature substrates and such plastic material have glass transition temperature of not greater than 180 C (see col. 3, lines 1-45).

Mitlitsky et al do not disclose PET or PEN as low temperature substrate. Takenouchi et al discloses a product of photovoltaic devices using low temperature substrates such as polyethylene terepthalate (PET)or (polyethylene sulfone(PES). It would have been obvious to replace PET

substrate of Takenouchi et al with PES substrate of Mitlitsky et al, because both PES and PET are functionally equivalent as taught by Takenouchi et al.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitlitsky et al in combination with Takenouchi et al.

Providing low temperature plastic material such as polyethersulfone (PES), and such plastic material are in capable of sustaining process temperature of higher than 180 C and such materials are called low temperature substrates. Mitlitsky et al further disclose depositing a photovoltaic film such as CdTe at a temperature in the range of 100-150 C so that evaporation technique does not exceed the temperature of the substrate greater than 180 C, and then performing laser pulse heating a t a temperature of (see col. 3, lines 1-45). Mitlitsky et al performs pulsed laser annealing to crystallize the CdTe at very high temperature as high as 900 C without heating and damaging the underlying low temperature plastic substrate(see col. 4, lines 59-67). Mitlitsky uses plastic substrate of 25 microns(see col. 5, lines 5-7) and time period for laser heating 100 microseconds, which is less than claimed time period of 0.01 sec to 1 sec and also power is not same as power in Mitlitsky et al. However, such power of the pulse laser energy and time period depends on the thickness of the substrate and thickness of the photovoltaic layer etc., . The choice of selecting the power and time period of pulse laser exposure would have been well within the scope of one of ordinary skill in the art depending on the thickness of the substrate and thickness of the photovoltaic layer etc. The crux of the instant invention is depositing CdTe at

lower than transition temperature of the plastic material such as PET and not damaging the plastic substrate by exposing the laser at temperature higher than transition temperature and very short period of time. Mitlitsky et al does not teach using PET as a substrate.

Takenouchi et al discloses using the substrate as PET or PES. It would have been obvious to one of ordinary skill in the art to replace PES with PET because Takenouchi discloses the art recognized equivalents as substrate material for the process solar cells. PET as a substrate material used in Takanouchi et al must be conductive and transparent.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d

887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of copending Application No. 09/890,393. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the instant claim limitations in instant application is encompassed by the claim limitation of the copending application, wherein in instant claims call for CdTe active layer

deposited of thickness almost 30 microns on PET or PEN substrate with glass transition temperature from 90 C to 200 C and substrate thickness of at least 60 microns and annealing at least 250 C and in the range of 400 C -600 C. The difference is copending claim 1 has a recitation of "tempering by plasma" and instant claim 1 with limitation of "annealing with laser" . However, such plasma as recited in copending claim 1 is produced by laser as recited in claim 4 of copending application, which is covered by limitation of "annealing laser of the instant claim 1. Similarly, product claim of the instant claim 4 of CDTE deposited on PET or PEN is encompassed by the product claim 8 of copending application

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

In view of the arguments and remarks made by the applicant, where Mitlitsky does not use the substrate with glass transition temperature in the range of 90 C to 200 C, reaction is changed to obvious ness type rejection as modified by Takenouchi et al because Takenouchi discloses the functional equivalence of PES or

PET. Mitlitsky et al as modified by the teaching of Takenouchi et al would have PET as substrate.

Applicant's arguments filed on 12/13/02 have been fully considered but they are not persuasive. Rejection on claims 4-6, 8,9 over Taniguchi as modified Mitlitsky. Applicants arguments over coating temperature and annealing temperature and time in view of the Takenouchi teaching instability of PET over PES to modify the teaching Mitlitsky is not convincing. However, Takenouchi clearly mention either PET. or PES are art recognized equivalents as low temperature substrates to grow photovoltaic cells.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mulpuri whose telephone number is (703) 305-5184. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SAVITRI MULPURI
PRIMARY EXAMINER